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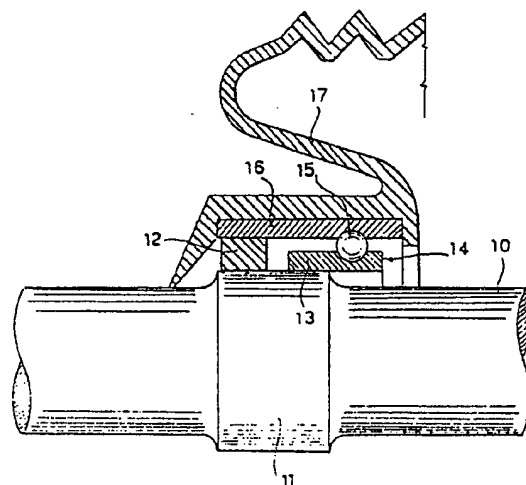
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(54) **Seal gasket with bearing for vehicles propeller shafts.**

(57) Seal gasket with bearing for propeller shafts (10) of vehicles of the type in which a rolling bearing (14) is associated with the sealing gasket (12) and both of them are interposed between the case (17) and the shaft (10). At least an inner race (13) of the bearing (14) is keyed directly on the enlarged and ground section (11) of the shaft, and the sealing gasket (12) is associated with the bearing (14) in such a manner as to be prevented from sliding axially on said shaft section (11) on which it is mounted as well.

Fig.1



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SEAL GASKET WITH BEARING FOR VEHICLES PROPELLER SHAFTS

The invention refers to a seal gasket with bearing for vehicles propeller shaft.

The drive shafts of the vehicles, especially those outcoming from the differential, hold an elastic case which has the task of avoiding oil leakages towards the outside and the penetration of external agents like dust, dirt and mud among the mechanical elements to which the drive shaft is connected.

Such case at one end is attached to an immovable point and at the other end it is wound on a ground section of the shaft with an interposed seal gasket.

Usually, between the gasket and the case there is also a bushing which is extending on the shaft in the inner part of the case.

During motion, the shaft is usually subject to various type of movements - oscillating and horizontal traveling - so that the bushing and the gasket continuously slide on the ground section on which they are assembled, which get fouled by external agents. Frictions which cause progressive wearing of such reciprocally sliding elements are thus created, first of all of the gasket, originating oil leakages towards the outside and the ingoing of external agents over the case.

A realization for the overcoming of such inconveniences foresees the assembly of the gasket between the inner race and the outer race of a bearing and the latter on a bushing keyed on the shaft. This unit therefore remains stationary on the enlarged and ground section of the shaft during its oscillations and horizontal travelings, with consequent adaptation to them by the case; this solution therefore requires the utilization of another element - the bushing - with subsequent high precision machining operations on the reciprocally assembled elements.

In any case, between the inner race of the bearing and the bushing, some oil leakages may take place during operation and following the wear of such elements.

Purpose of the invention is to propose a device which allows to cancel the above mentioned problems caused by the wear of the reciprocally sliding elements; the invention, in fact, proposes a device where the seal gasket and the bearing are immovably assembled on the shaft, but without the interposition of further elements thus making the manufacture of the unit simpler and avoiding the risk of oil leakages and the necessity to effect complex and expensive machinings on the various elements of the unit.

For these and other purposes which will be better appreciated as the description follows, the invention proposes to realize a seal gasket with

bearing for vehicles shafts of the type in which a rolling bearing is associated with a sealing gasket and both of them are interposed between the case and the shaft, characterized in that at least the inner race of the bearing is keyed directly on the enlarged and ground section of the shaft and the seal gasket is associated with the bearing so as to be prevented from sliding axially on said section of the shaft on which it is assembled as well.

The description of the invention will now follow, and reference will be made to the enclosed drawings:

Figure 1 is the axial section view of the shaft where the device according to the invention is foreseen.

Figures 2, 3, 4, 5 and 6 are further configurations of the device according to the invention and attain equal utility among them, utilizing the same new design concept.

According to the invention the shaft 10 has a short enlarged and ground section 11, on which the gasket 12 and the inner race 13 of a bearing are directly assembled. The race 13 is assembled on the shaft 10 so that the balls 15 be projecting, whilst the outer race 16 is inserted in a plane section of the case 17 and is extending on the external surface of the gasket 12, being thus interposed between the case 17 and the gasket 12.

The gasket 12, by this device, is axially fixed to the shaft 10 so that it is not compelled to move on dirty surfaces, wearing out and originating oil leakages.

Furthermore, there is no danger of oil leakages between the inner race 13 and the shaft 10 on which the race 13 is directly keyed.

Neither the gasket 12, nor the bearing 14 are subject to axial slidings, then the ground surface 11 of the shaft is reduced to a minimum.

It must be noticed that a wider tolerance is allowed on the diameter of the shaft 10, as the balls 15 are "projecting".

Finally, the gasket 12 "runs" on a non-eccentric counterface and therefore there is no risk of early wearing.

Fig. 2 illustrates how it may also be possible to key the inner race 13 on the shaft interposing the gasket 12 between the two races 13 and 16 of the bearing, the balls of which are no more projecting.

With respect to the solution of Fig. 2, Fig. 3 illustrates that the outer race 16 does not wind also gasket 12, so a sleeve is interposed among the gasket, the race 16 and the case 17.

The solution of Fig. 4 foresees an inner race 13 that copies the surface in the step section of the shaft 10, whilst the outer race 16 involves not only

the balls 15, but also the gasket 12.

Finally, the solutions illustrated in Fig. 5 and 6 are two *vice versa* variations of the solutions of Fig. 2 having outer race 16 and inner race 13 of the bearing rectilinear in the respective contact surfaces of the shaft and of the case.

Claims

1. Seal gasket with bearing for propeller shafts of vehicles of the type in which a rolling bearing is associated with the sealing gasket and both of them are interposed between the case and the shaft, characterized in that at least the inner race of the bearing is keyed directly on the enlarged and ground section of the shaft and the sealing gasket is associated with the bearing in such a manner as to be prevented from sliding axially on said shaft section on which it is mounted as well.

2. Seal gasket according to claim 1 characterized in that the inner race of the bearing is assembled in such a manner that its balls be projecting on it, whilst the gasket is assembled directly on the shaft and the outer race of the bearing is extending to form interposition between the case the the gasket.

3. Seal gasket according to claim 1 characterized in that the gasket is interposed between the outer and inner races of the bearing.

4. Seal gasket according to claim 1 characterized in that the inner race of the bearing is extending to form interposition between the gasket and the shaft.

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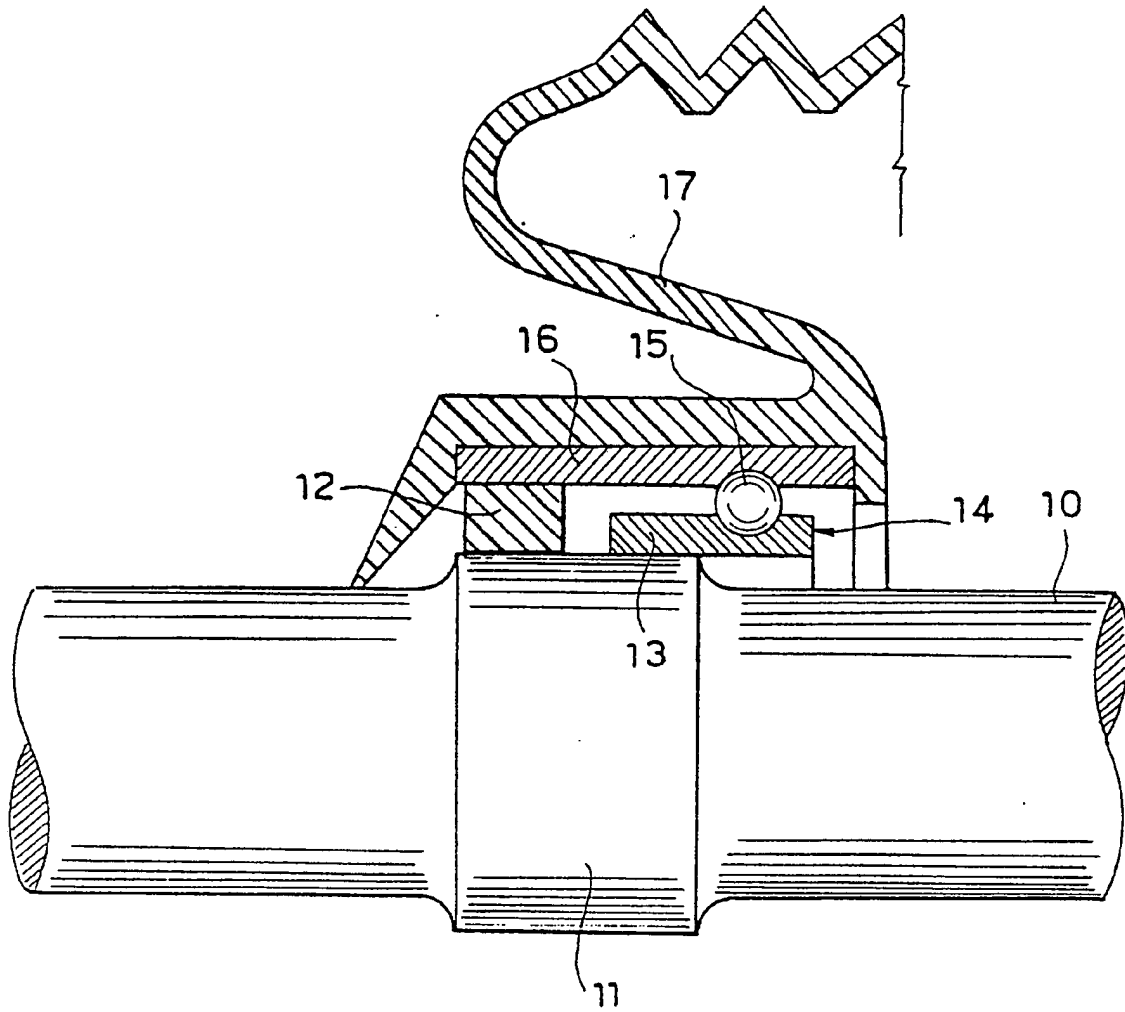
Fig.1

Fig. 2

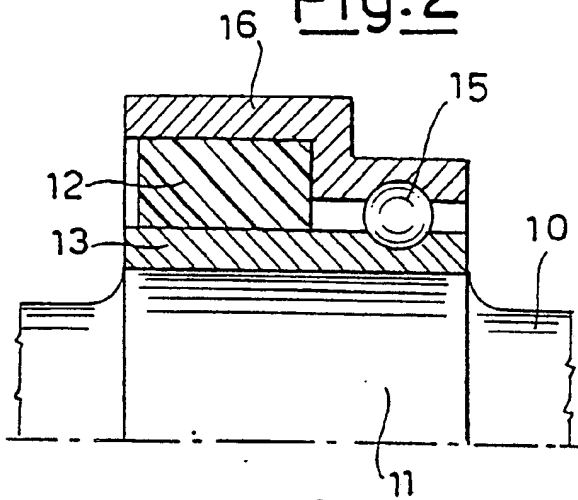


Fig. 4

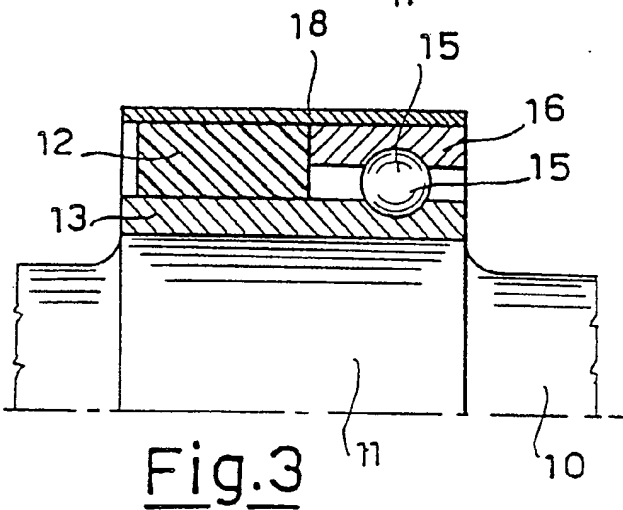
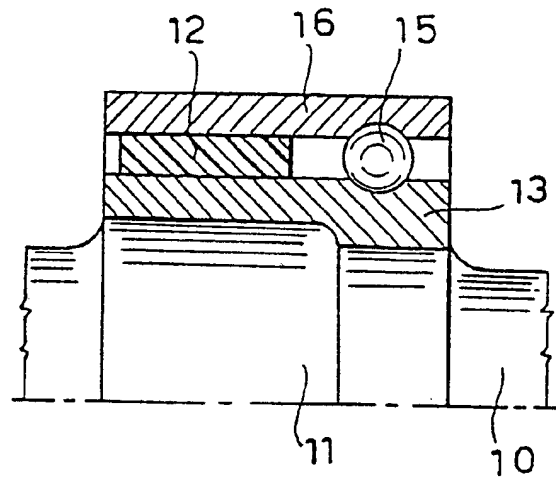


Fig. 5

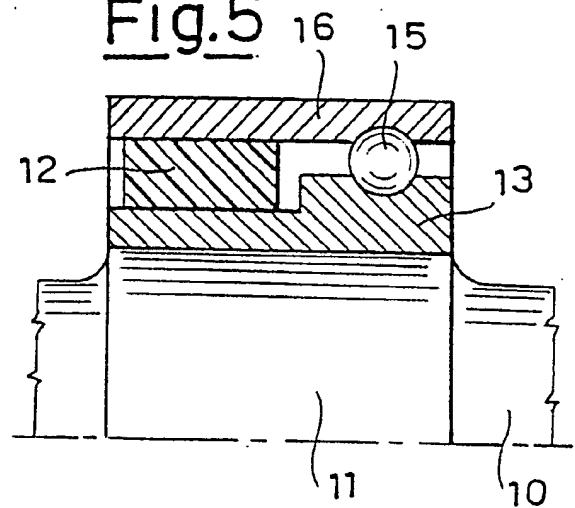


Fig. 3

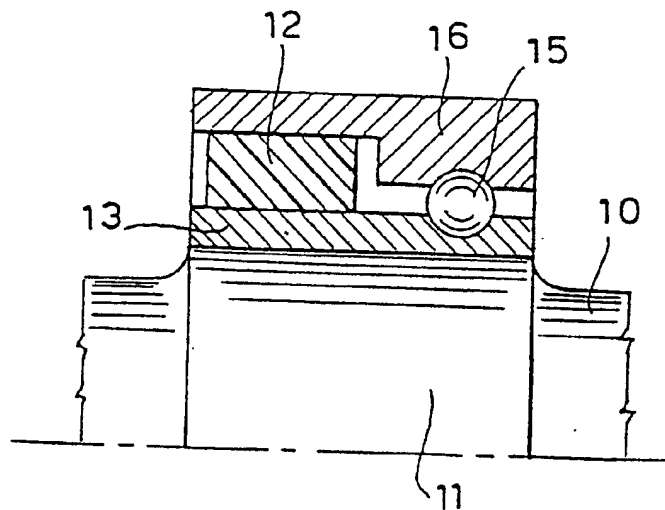


Fig. 6



European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 88 20 0433

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	WO-A-8 001 939 (DANA) * Page 5, lines 8-25; figure 3 * ---	1,3,4	B 60 K 17/24 F 16 C 33/76
X	US-A-2 092 291 (OLSEN) * Page 2, column 1, line 67 - column 2, line 26; figure 2 * ---	1	
Y	---	2	
Y	US-A-3 619 017 (ROBINSON) * Abstract; figure 2 * ---	2	
A	DE-A-1 944 919 (GWB) * Page 4, paragraph 3 - page 5, paragraph 1; figure 1 * ---	1,3,4	
A	US-A-2 165 155 (SCHMAL) * Page 1, column 2, lines 1-53; figure * ---	1,4	
A	US-A-1 387 993 (LEON) * Page 1, lines 46-58; figure * -----	2	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 60 K F 16 C
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	10-08-1988	FLODSTROEM J.B.	
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	